Second Five-Year Review Report

Jones Sanitation Superfund Site

Town of Hyde Park
Dutchess County, New York

Prepared by:

U.S. Environmental Protection Agency
Region 2
New York, New York

June 2011

Five-Year Review Report

Table of Contents

Tables

List of Acronyms

BHHRA	Baseline Human Health Risk Assessment
CR	Cancer Risk
COPC	Contaminant of Potential Concern
DCHD	Dutchess County Health Department
EPA	United States of Environmental Protection Agency
FS	Feasibility Study
HI	Hazard Index
MCLs	Maximum Contaminant Levels
LMS	Lawler Matusky & Skelly Engineers LLP
NPL	National Priorities List
NYSDOH	New York State Department of Health
NYSDEC	New York Department of Environmental Conservation
NYCRR	New York Code of Rules and Regulations
O&M	Operation and Maintenance
OIG	Office of Inspector General
OSWER	Office of Solid Waste and Emergency Response
PAH	Polynuclear aromatic hydrocarbon
PCBs	Polychlorinated biphenyls
PPB	Parts Per Billion
PPM	Parts Per Million
PRP	Potentially Responsible Party
RAO	Remedial Action Objective
RI/FS	Remedial Investigation/Feasibility Study
ROD	Record of Decision
RPM	Remedial Project Manager
RSLs	Regional Screening Levels

SVOC	Semi-Volatile Organic Compound
VOC	Volatile Organic Compound
WRS	WRS Infrastructure and Environment, Inc.
WQS	Water Quality Standards

EXECUTIVE SUMMARY

The remedy for the Jones Sanitation site located in Hyde Park, Dutchess County, New York includes a landfill area and on- and off-property groundwater monitoring wells. The trigger for this five-year review was the previous five-year review conducted in June 2006.

Based upon review of the 1997 Record of Decision, operation and maintenance reports and inspection of the site, it has been concluded that the remedy is functioning as intended by the decision documents and is protecting human health and the environment.

This is the second five-year review for the Jones Sanitation Superfund site.

Five-Year Review Summary Form

SITE IDENTIFICATION		
Site Name *(from WasteLAN)*: Jones Sanitation Superfund site		
EPA ID *(from WasteLAN)*: NYD 980534556		
Region: 2	**State:** NY	**City/County:** Town of Hyde Park, Dutchess County

SITE STATUS	
☐ **NPL Status:** ☐ Final ■ Deleted ☐ Other (specify)	
Remediation Status: ☐ Under Construction ☐ Operating ■ Construction Complete	
Multiple OUs? ☐ YES ■ NO	**Construction completion date:** 12/6/2002
Are portions of this site and/or investigated adjacent properties in use or suitable for reuse? yes	

REVIEW STATUS	
Lead agency: ■ EPA ☐ State ☐ Tribe ☐ Other Federal Agency	
Author name: Isabel Rodrigues	
Author title: Remedial Project Manager	**Author affiliation:** EPA
Review period:** 6/27/2006 to 6/27/2011	
Date(s) of site inspection: 5/25/2011	
Type of review: ☐ Post-SARA ☐ Pre-SARA ☐ NPL-Removal only ☐ Non-NPL Remedial Action Site ☐ NPL State/Tribe-lead ☐ Regional Discretion ■ Statutory	
Review number: ☐1 (first) ■ 2 (second) ☐ 3 (third) ☐ Other (specify)	
Triggering action: ☐ Actual RA Onsite Construction at OU # 1 ☐ Actual RA Start at OU# 1 ☐ Construction Completion ■ Other (specify) Previous 5-year review report	
Triggering action date *(from WasteLAN)*: 6/27/2006	
Due date *(five years after triggering action date)*: 6/27/2011	
Does the report include recommendation(s) and follow-up action(s)? ☐ yes ■ no **Is human exposure under control?** ■ yes ☐ no **Acres in use or available for use:** **restricted:** 57 **unrestricted:** 0	

Five-Year Review Summary Form (Continued)

Remedy Assessment Summary

Based on the data reviewed and the site inspection, the remedy is functioning as intended by the 1997 Record of Decision (ROD). The cap is effectively limiting the infiltration of water into and through the landfill materials, and it appears to have positive impacts on the groundwater conditions. The cap also prevents direct contact exposure and fencing restricts access to the cap. There have been no changes in the physical conditions of the site that would affect the protectiveness of the remedy.

Issues, Recommendations, and Follow-Up Actions

The only issue identified as a result of this Five-Year review is to demonstrate that monitoring well JSMS-6B is no longer needed and either abandon or replace with a PVC well.

Protectiveness Statement

The remedy for the Jones Sanitation Superfund site protects human health and the environment. There are no exposure pathways that could result in unacceptable risks and none are expected as long as the engineered and institutional controls currently in place continue to be properly operated, monitored and maintained.

I. INTRODUCTION

This second five-year review for the Jones Sanitation Superfund site (site), located in Hyde Park, Dutchess County, New York, was conducted by the United States Environmental Protection Agency (EPA) Remedial Project Manager (RPM) Isabel Rodrigues. The review was conducted pursuant to Section 121(c) of the Comprehensive Environmental Response, Compensation, and Liability Act, as amended, 42 U.S.C. 9601 *et seq.* and 40 CFR 300.430(f)(4)(ii) and done in accordance with the Comprehensive Five-Year Review Guidance, OSWER Directive 9355.7-03B-P (June 2001). The purpose of five-year reviews is to ensure that implemented remedies protect public health and the environment and that they function as intended by the site decision documents. This report will become part of the site file.

In accordance with Section 1.3.1 of the five-year review guidance, this five-year review is triggered by the signing date of the previous five-year review report. The previous five-year review report was signed on June 27, 2006.

II. SITE CHRONOLOGY

Table 1 summarizes the site chronology.

III. BACKGROUND

Site Location

The Jones Sanitation site consists of a 57-acre parcel of land located approximately one-half mile northeast of the intersection of Crum Elbow Road and Cardinal Road in Hyde Park, New York. The Maritje Kill flows from northeast to southeast across the eastern side of the site. Another unnamed stream enters the northern side of the site, flows into wetlands on the western side of the property, and flows off-site to the west.

There are wetland areas located on-site that are principally associated with the Maritje Kill and the unnamed stream. The wetlands associated with the unnamed stream are slightly larger (6.6 acres) in extent than the wetlands associated with the Maritje Kill (6.1 acres). The major portion of the wetlands associated with each stream is concentrated in the lower half of the stream course. In addition to the wetlands associated with the streams, there are three small isolated wetland areas located in the northeastern corner of the property.

The wetlands on the Jones Sanitation site pose no unique characteristics of social significance though they do provide flood flow alteration and wildlife habitat. The only potential impact of the completed closure upon the wetlands is a slight increase in the extent and duration of inundation/saturation due to the increased rate of volume of surface runoff from the cap area into the wetlands.

The physical site conditions are characterized by shallow soil deposits (0 to 15 feet) underlain by bedrock consisting of sandstone and shale. Several bedrock ridges with numerous surface outcropping are present at the site. Overburden groundwater appears to flow from the central disposal area to the wetlands and surface water streams to the north and west.

Land and Resource Use

The site is zoned residential but existing commercial use has been grandfathered. Adjacent land use consists primarily of residential and undeveloped land. Single-family homes are located along Matuk Drive and Thurston Lane to the south and along Cardinal Road to the west. Val-kill trailer park, housing approximately 100 residences, is located to the southwest. This site is currently in use. The cleared area is used for parking and storage of trucks. The wetlands and wooded areas are considered to be in ecological use. The entire property has institutional controls restricting groundwater use.

History of Contamination

Septage operations began at the site in approximately 1956 by Mr. William Jones, Sr., under the name of William Jones Sanitation Services (Jones Sanitation). The wastes that were treated and disposed of at the site during its approximately 30 years of operation include septage wastes, primarily liquid, from residential, commercial, institutional, and industrial facilities. Septage and industrial wastewater were disposed of together in approximately 30 to 40 shallow, randomly oriented trenches located mostly within the central area of the site. Trenches were reportedly three to five feet deep, with lime applied to septage disposed of in trenches to reduce odors. After the trenches were full and liquids had leached out into the ground, the trenches were covered with sand and gravel.

The DeLaval Separator Company (DeLaval), which changed its name to Alfa-Laval in 1980, operated a facility in Poughkeepsie from 1963 to 1990. Untreated industrial wastewater from DeLaval's industrial plant was transported to the site for disposal which contained hazardous substances, including, but not limited to trichloroethylene, methylene chloride, chloroform, 1,1,1-trichloroethane, naphthalene, chromium, copper, lead and zinc.

Basis for Taking Action

Beginning in 1970, the site became the focus of several investigations by the New York State Department of Environmental Conservation (NYSDEC) and the Dutchess County Health Department (DCHD). The investigations included limited sampling of on-site soils, groundwater, surface water, and sediment from the streams on-site. Some off-site private and public wells were also sampled. Volatile organic compounds (VOCs), semi-volatiles organic compounds (SVOCs), polynuclear aromatic hydrocarbon (PAH) compounds, polychlorinated biphenyls (PCBs) and metals were detected at varying concentrations in site media. Based on the results of these investigations, the site was placed on the National Priorities List (NPL) in July 1987. At that time, EPA became the lead agency for the site, with support from the NYSDEC.

The Remedial Investigation (RI) included: a soil investigation consisting of soil gas survey, seismic survey, and soil boring program; a hydrogeologic investigation consisting of aquifer testing, well installation, and groundwater sampling; a surface water and sediment investigation; and, an ambient air monitoring program. Environmental sampling activities at the site included collection and analysis of 179 soil gas samples, 120 subsurface soil samples, 11 surface water samples and 11 sediments samples. Also, groundwater samples were obtained from 13 overburden monitoring wells and 15 bedrock monitoring wells, as well as ten off-site potable wells. The DCHD and New York State Department of Health (NYSDOH) have sampled off-site private and community wells on several occasions and contaminants related to the site were not detected in drinking water supply wells.

The results of the RI indicated that VOCs, SVOCs, PAHs and heavy metals in the soil and VOCs and metals, including, but not limited to arsenic and manganese in the groundwater presented an unacceptable potential threat to public health at the site under future use scenarios. A complete list of chemicals for which cleanup goals were identified is presented in Table 2 of the ROD. The RI and human health risk assessment concluded that for potential future residents, there were carcinogenic risks for ingestion of soil and groundwater at the site.

Initial Response

In March 1991, the owner of the site, Theodore Losee, and Alfa-Laval, Inc., signed an Administrative Order on Consent with EPA in which they agreed to perform a Remedial Investigation andFeasibility Study (RI/FS). The RI was completed in 1995. In 1994, a FS of potential remedial alternatives was begun by Lawler Matusky & Skelly Engineers LLP (LMS) on behalf of Alfa-Laval. A final FS report was completed in 1996.

IV. REMEDIAL ACTIONS

Remedy Selection

On March 31, 1997, EPA issued a Record of Decision (ROD) selecting a remedial action for the site. The goal of the remedial action is to contain the source area and to prevent further migration of contaminants to the groundwater to the extent practicable. Substantial contaminants were not found in sediments or surface water; therefore no Remedial Action Objectives (RAOs) were necessary for these media.

The major components of the selected remedy consist of the following:

On-Site Soils

- Construction of a 4.8-acre cap over the central disposal area in conformance with the major elements described in 6 NYCRR Part 360 for solid waste landfill caps.

- Construction of surface water controls consisting of concrete culverts around the perimeter of

the cap and the other locations as necessary to ensure that runoff water does not erode the topsoil layer.

- Implementation of long-term maintenance program for the cap to ensure cap integrity.

- Excavation of contaminated soils above the remedial action objectives in outlying trench areas and consolidated into the central disposal area.

- Collection of confirmatory samples from the bottom and sidewalls of the trench unit excavations. Backfill the trenches with clean fill and overlay with a 6-inch layer of clean topsoil and grass cover.

- Implementation of institutional controls such as deed restrictions, to limit access and to prohibit interference with the completed cap.

Groundwater

- Implementation of a long-term groundwater monitoring program.

- Implementation of institutional controls such as deed restrictions, and/or well permitting restrictions to prevent human contact with contaminated groundwater at the site.

Streams and Wetlands

No remedial action was required for the streams and wetlands as there were no adverse impacts observed. During the remedial design, further ecological risk assessment was performed that confirmed that the surroundings streams and wetlands had not been impacted.

Remedy Implementation

A Consent Decree addressing the preparation of the remedial design documents and the performance of selected remedial actions was lodged on November 21, 1997 and entered on February 4, 1998.

Soil Remediation

In July 2000, the final Remedial Design Report was submitted to EPA. This report established the design criteria and schedule for the remediation including the requirements for long-term groundwater monitoring once the remediation was completed.

WRS Infrastructure and Environment, Inc. (WRS) was selected by Alfa Laval to implement the approved remedial activities at the site. The remedial construction at the site started in June 2001.

The west central portion of the site is now occupied by the capped area that serves to isolate the

central disposal area and the waste materials which were removed from the outlying disposal areas northeast, east and south of the central disposal area. A total of 13,864 yards of material was removed from eight outlying areas and consolidated under the cap. The resulting excavations were backfilled and revegetated. Once the waste materials were consolidated under the cap, a final cover system was installed in conformance with 6NYCRR Part 360 regulations. The analytical results from post excavation soils samples collected from the excavated areas indicated that the remediation of all excavated areas reduced contaminant concentrations in soils to below the cleanup levels required by the ROD. Construction activities for the soils were completed in November 2001.

Groundwater Remediation

Once the excavations and cap were completed, seven monitoring wells were installed at various locations at the site as part of the ongoing remedial efforts for the groundwater at the site and to monitor the performance of the remedial action on soils. The installation of the groundwater monitoring wells was completed in December 2001.

Institutional controls were implemented at the site. An environmental easement with restrictive covenants was filed with Dutchess County in August 2003. The environmental easement prohibits any development in the permanent cap area. There will be no groundwater extraction wells installed on any part of the site and there will be no activities that would materially interfere with the maintenance or integrity of the monitoring wells installed at the site.

All elements of the construction phase of the remediation have been completed at the site. On-going activities at the site include the long-term groundwater monitoring and operation and maintenance (O&M) activities.

Supplemental Ecological Risk Assessment

Although an ecological risk assessment was performed during the RI, the ROD for the site required that further field investigations were warranted during the remedial design to better assess the environmental impacts to this area. This additional ecological investigation was completed in February 2000. This report concluded that there was no unacceptable ecological risk. Furthermore, the near-absence of fish resources on the site, lack of critical habitats for endangered or threatened species, or evidence of off-site transport of site-generated chemicals in excess of applicable criteria preclude the need for further assessment.

Site Completion

The site achieved construction completion status with the signing of the Preliminary Close-Out Report on December 6, 2002. The site was deleted from the NPL on September 23, 2005.

Operation, Maintenance, and Long-Term Monitoring

The long-term groundwater monitoring at the site include groundwater sampling of on-site monitoring wells and off-site sampling of nearby residential wells. The groundwater monitoring program includes 15 on-site monitoring wells (see Figure 1) constructed both in the shallow and deeper portions of the on-site aquifer located outside the landfill area. A series of monitoring wells were installed on-site around the periphery of the cap to evaluate groundwater quality beneath and adjacent to the site. Monitoring wells were installed in pairs, one screened in the overburden, the second in the shallow bedrock. In addition, ten off-site residential drinking water supply wells in the vicinity of the site were included in the program. The long-term monitoring program originally consisted of quarterly sampling of the on-site monitoring wells and annual sampling of the residential wells. Pursuant to the ROD for the site, monitoring of the residential wells would be conducted for a period of five years, after which the results of the program would be re-evaluated to determine if monitoring should be continued and if so with what frequency and protocols. This monitoring program was initiated upon the completion of the remedial action for the site in 2001. After collecting data for a period of five years, the results were evaluated, and a determination was made in 2006 that no additional monitoring of the residential wells would be necessary.

An O&M program is part of the remedy for the site and has been developed and implemented. The O&M program includes: routine inspections of the capped area; a semi-annual gas venting monitoring program; and maintenance of the established vegetation cover within the capped area.

Institutional Controls Implementation

The ROD included recommendations for limiting future use of the site and the groundwater through deed restrictions, to insure that the remedial measures which have been taken on the site will not be disturbed and that the site will not be used for purposes incompatible with the completed remedial action. Institutional controls were implemented at the site. An environmental easement with restrictive covenants was filed with Dutchess County in August 2003. There is limited reuse of the site. The environmental easement prohibits any development in the permanent cap area. The easement also applies to the overburden and bedrock aquifer, even though the overburden aquifer on-site is not a viable source of potable water. There will be no groundwater extraction wells installed on any part of the site and there will be no activities that would materially interfere with the maintenance or integrity of the monitoring wells installed at the site.

V. Progress Since last Five-Year Report

The first five-year review for this site was signed on June 27, 2006. The five-year review concluded that the remedies selected in the 1997 ROD and implemented were protective of human health and the environment. There were no relevant issues and recommendations.

Since the first five-year review was completed, the only activities that have occurred include

long-term monitoring of groundwater and operation and maintenance of the landfill cap. A review of water-quality data has showed exceedance of total (and filtered) nickel and chromium in well JSMW-6B, the NYSDEC Class GA Standard being 100 and 50 micrograms per liter (µg/L), respectively. In addition, in 2008, the EPA Office of Inspector General (OIG) was reviewing long-term monitoring results at Superfund sites that EPA had deleted from the National Priorities List. The Jones Sanitation site was one of the eight sites being reviewed. During the OIG review, groundwater samples were collected and data was evaluated. Based on their findings, nickel and chromium exceeded standards in the boundary well JSMW-6B, raising the concern that nickel and chromium may be migrating off-site. However, the high levels of nickel and chromium in JSMW-6B are consistent with historical patterns. The presence of chromium and nickel at low concentrations in well JSMW-6B has persisted since 2005. JSMW-6B is a stainless steel well and such well material can leach chromium, nickel (and zinc) under brackish aqueous conditions. The persistence of these metals in well JSMW-6B has been attributed the deterioration of stainless steel in the well. Other site wells do not show persistent levels of nickel and chromium, including JSMW-6A, a PVC well located next to JSMW-6B. The field sampling reports also indicate the presence of high levels of turbidity and relatively high specific conductance measurements in well JSMW-6B, which are indicative of brackish conditions that can lead to deterioration of stainless steel.

VI. FIVE -YEAR REVIEW PROCESS

Administrative Components

The five-year review team consisted of Isabel Rodrigues (Remedial Project Manager), Peter Mannino (Western New York Remediation Section Chief), Julie McPherson (Risk Assessor), Edward Modica (Hydrogeologist) and Nicole Bujalski (Hydrogeologist) of EPA, and Wayne Mizerak (Project Manager) of NYSDEC.

Community Involvement

The EPA Community Involvement Coordinator for the Jones Sanitation site published a notice in *the Daily Freeman*, a local newspaper notifying the community of the initiation of the five-year review process, on December 27, 2010. The notice indicated that EPA would be conducting a five-year review to ensure that the remedies implemented at the site remain protective of public health and are functioning as designed. It also indicated that once the five-year review is completed, it will be made available in the local site repository.

In addition, the notice included the RPM's mailing addresses and telephone number in the event the public had any comments or questions. No comments were received.

The site remedy was discussed with representatives for the PRP. There were no interviews with local officials or community representatives.

Document Review

This five-year review consisted of a review of relevant documents including O&M records and monitoring data. See Table 2.

Data Review

Annual Residential Groundwater Well Sampling Program

The ROD required groundwater sampling to be conducted on both on- and off–site wells, including off-site private drinking water wells. In the event that contaminant levels remain below groundwater standards in the off-site wells during the five-year monitoring period, the monitoring program will be reevaluated.

Beginning in 2001, an annual residential sampling potable well monitoring program was established to ensure that no site-related contaminants are impacting the nearby off-site residential wells. The ten residential wells included in the long-term monitoring program were selected based on the anticipated groundwater flow directions, proximity to the site, and which aquifer the well was drawing water from. The wells selected include three overburden wells less than 100 feet deep and seven bedrock wells which range from 109 to 220 feet deep.

A review of the 2006 residential potable well sampling results revealed that no site-related VOCs were detected in any of the residential wells. Two metals, sodium and iron, were detected at concentrations exceeding the NYSDEC Water Quality Standards (WQS) for surface water and groundwater. Sodium was detected above the NYSDEC standard of 20,000 ug/l in groundwater collected from eight of the ten residential wells sampled. Sodium concentrations exceeding the NYSDEC standard ranged from 25,000 ug/l to 85,000 ug/l. The iron concentration in groundwater collected from one residential well was 1,200 ug/l. This was the only residential well from the 2006 sampling event found to have iron in groundwater above the NYSDEC standard of 300 ug/l. It is important to note that historical water-quality data from wells in the landfill area and from the surrounding residential areas indicate that groundwater typically exhibit elevated concentrations of several metals. Groundwater in the area is characterized as being somewhat brackish. Consequently, detection of these chemical constituents in wells can be attributed to background.

Over the years, the groundwater quality data for the nearby residential wells indicate that the Jones Sanitation site does not impact the quality of the off-site groundwater in either the shallow overburden or deeper bedrock aquifer in the vicinity of the site. No site-related contaminants were detected in any of the groundwater wells that were tested. A review of the sampling results from the residential potable groundwater wells demonstrate that off-site groundwater has not been impacted by the site. Therefore, the residential potable well sampling program was discontinued in 2006, five years after the initial sampling was conducted.

On-Site Monitoring Groundwater Well Sampling Program

Long-term groundwater monitoring at the Jones Sanitation site has been conducted since 2003. The objectives of the long-term monitoring of the 15 selected on-site groundwater monitoring wells are to provide additional data on the chemical composition, especially VOCs and metals, of groundwater on-site; evaluate whether the landfill closure has substantially changed groundwater flow patterns and chemistry; and, to observe the natural attenuation of contaminants in the groundwater. The on-site wells are located within a shallow zone at approximately 20 feet below the ground surface and a deeper zone at approximately 35 feet below the ground surface.

Results of the groundwater sampling program from 2005 to 2011 revealed that several VOCs were detected in the on-site monitoring wells. Benzene was also present at concentrations ranging from 2.8 ug/l to 1.9 ug/l. The concentrations have decreased and have exhibited concentrations less than the cleanup goal/RAO (0.7 ug/l), the current NYSDEC standard (1.0 ug/l) and EPA's Primary Drinking Water Standard - MCL (5 ug/l). Concentrations of chlorobenzene range from 13 ug/l to 19 ug/l. The concentrations have been on the increasing trend within the last three rounds of sampling but have been found to be decreasing when compared to the concentrations detected between 2002 and 2005. The concentrations continue to exceed the NYSDEC WQS (5 ug/l) but are below EPA's MCL (100 ug/l). It should be noted that the benzene and chlorobenzene concentrations have only been detected in monitoring well JSMW-3B. This well is located downgradient of the original excavated trench areas and directly upgradient of the capped area. This well also exhibits concentrations of iron and manganese that are not consistent with background. In addition, several other VOCs have been detected in the monitoring wells within the past five years above their respective NYSDEC WQS and MCLs, however, the concentrations have decreased and are currently (2011) below their MCLs and NYSDEC WQS.

The anomalous finding that has persisted since 2005 has been the presence of chromium and nickel at low concentrations in well JSMW-6B (screened interval at 17- 27 feet). No other detections of these metals have historically occurred at significant concentrations in other wells included in the on-site groundwater sampling program. Results in 2011 indicate that levels are similar to previous years and have actually decreased when compared to the previous sampling conducted in 2008. During each sampling event, purge water removed from JSMW-6B has been found to be very turbid with a distinctive orange color thought to be result of rusting corrosion of the well riser/screen or the surface protective casing (large steel casing housing three separate wells). It shall be noted that the well has always exhibited poor recharge rates making it difficult to obtain adequate sample volumes. It is possible that metals leaching from the well construction are present in the groundwater sampling results at elevated levels due to concentration in the water column at the time of sampling.

Within the past five years, several metals have been detected above their respective cleanup levels/RAOs (See Table 5) or MCLs. Although "total" metal samples exceed their respective chemical-specific cleanup goals, the concentrations of metals detected in "filtered" samples are below their respective cleanup goals, with the exception of iron, manganese, selenium, antimony, thallium and nickel. Antimony, thallium, selenium and nickel were not identified as site-related

chemicals in the ROD. The exceedences of iron and manganese occur primarily in monitoring wells JSMW-3 and 8. The concentrations are elevated when compared to other site monitoring wells and background.

A review of the sampling results from the on-site groundwater monitoring wells demonstrates that the impacts to the groundwater are limited to only a few isolated on-site wells (JSMW-3B, JSMW-4A, JSMW-4B, JSMW-6A, and JSMS-6B).

Landfill Gas Monitoring Program

As part of the landfill gas monitoring program, LMS conducted gas monitoring to evaluate the composition and concentrations of gas vented from the landfill. The capped materials are generating minor amounts of gas that is passively venting from the nine gas vents in the cap. Measurable levels of gas are only noted in the vents themselves and perimeter monitoring did not indicate any gas levels above background. The generated gas does not cause an odor or nuisance on-site or for the surrounding properties. The capped area is functioning as intended and only routine maintenance such as mowing and vector control are necessary.

Fencing

Inspections of the site fence indicate no deficiencies in, or need for repair of the fencing.

Site Inspection

A site visit related to this five-year review was conducted on May 25, 2011. EPA representatives, Isabel Rodrigues, Julie McPherson, Edward Modica and Nicole Bujalski were accompanied by Michael Lehtinen, project manager for HDR on behalf of the potentially responsible parties (PRPs) and Wayne Mizerak, project manager of NYSDEC. During the site inspection, the EPA and NYSDEC representatives did not observe any problems or deviations from the ongoing operation and maintenance activities being implemented at the site. The cap appeared fully vegetated with no bare spots and no evidence of erosion. Wetlands were observed with generally clear, non-odorous water. Site fencing was observed to be in perfect condition.

VII. TECHNICAL ASSESSMENT

***Question A**: Is the remedy functioning as intended by the decision documents?*

All components of the remedy for the Jones Sanitation site are functioning as intended by the decision documents. The remedy for the site as described in the 1997 ROD addresses contaminated soils and groundwater. The objectives of the remedy are to control source contamination at the site and reduce the migration of contaminants into the adjacent soils and into the groundwater. The soil remedy calls for capping, consolidation of contaminated soils from outlying areas beneath the cap, and surface water controls. The groundwater remedy involves a minimal action and includes long-term monitoring and implementation of institutional controls.

Cap installation and soil excavation activities were completed on the site by 2001. The cap covers a 4.8-acre area over the central disposal area of the site and was constructed in conformance with 6 NYCRR, Part 360. The cap includes a low permeability layer to reduce infiltration and a porous layer to enhance drainage. Soils in outlying areas that were contaminated above action levels were excavated and placed beneath the cap. Confirmatory sampling was conducted in excavated areas to ensure that no contaminated soil remained. The excavations were back filled with clean fill. An ongoing maintenance program ensures that the cap is in good repair. Based on the recent inspection, there are no major breaches or subsidence noted.

Other components of the remedy are functioning as designed and are in good working order. Surface water control consists of concrete culverts installed around the perimeter of the cap to ensure that runoff water does not erode the topsoil layer. The perimeter toe drainage and outfall system are functional and are well maintained. No major erosion of topsoil has occurred. Air quality is monitored at nine passive gas vents on the surface of landfill cap. Currently, the vents generate only minor amounts of gas. A perimeter fence is inspected monthly and is in good repair.

Groundwater Monitoring

A series of monitoring wells were installed on-site around the periphery of the cap to evaluate groundwater quality beneath and adjacent to the site. Monitoring wells were installed in pairs, one screened in the overburden, the second in the shallow bedrock. Wells have been monitored for VOCs and metals, initially on a quarterly basis, recently on an annual basis. The most recent data was collected in February of 2011.

The water-quality data for the last several years indicate some minor exceedences of benzene and chlorobenzene in well JSMW-3B. Exceedances of VOCs in JSMW-3B is consistent with historical patterns. The well is located just off the southeastern edge of the cap and is 33 feet into bedrock. Groundwater in this area flows to the southwest. There is no indication from monitoring wells on the west end of the property that any VOC contamination moves off-site.

Many monitoring wells also show exceedances of sodium, iron, and manganese standards. Results from the OIG site inspection of 2008 also noted that sodium exceeded standards for wells that were sampled. However, historical water-quality data from wells in the landfill area and from the surrounding residential areas indicate that groundwater samples typically exhibit elevated concentrations of sodium, iron, and manganese. Groundwater in the area is characterized as being somewhat brackish. Consequently, detection of these chemical constituents in wells can be attributed to background. See Table 3.

Institution Controls

The ROD included recommendations for limiting future use of the site and the groundwater through deed restrictions, to insure that the remedial measures which have been taken on the site

will not be disturbed and that the site will not be used for purposes incompatible with the completed remedial action. Institutional controls were implemented at the site. An environmental easement with restrictive covenants was filed with Dutchess County in August 2003. There is limited reuse of the site. The environmental easement prohibits any development in the permanent cap area. The easement also applies to the overburden and bedrock aquifer, even though the overburden aquifer on-site is not a viable source of potable water. There will be no groundwater extraction wells installed on any part of the site and there will be no activities that would materially interfere with the maintenance or integrity of the monitoring wells installed at the site.

***Question B**: Are the exposure assumptions, toxicity data, cleanup levels, and remedial action objectives used at the time of the remedy still valid?*

The majority of the exposure pathways and the receptor populations identified in the 1995 Baseline Human Health Risk Assessment (BHHRA) are still valid. Although some exposure assumptions have changed and several exposure pathways were not evaluated, it is not expected to affect the remedy.

The toxicity values for several contaminants of potential concern (COPCs) have changed since the remedial investigation (RI). In order to account for changes in toxicity values since the RI, the maximum detected concentrations of COPCs detected in the on-site monitoring wells during the sampling period 2006-2011 were compared to their respective residential groundwater Regional Screening Levels (RSLs) and MCLs and NYSDEC WQS. The MCL is the highest level of contaminant that is allowed in drinking water. MCLs are promulgated standards that apply to public water systems and are intended to protect human health by limiting the levels of contaminants in drinking water. The RSLs are a human health risk based value that is equivalent to a cancer risk (CR) of 1 x 10^{-6} or a hazard index (HI) of 1.

The MCL for arsenic has changed since the time of the remedy selection. In 2001, EPA lowered the MCL for arsenic from 50 ug/l to 10 ug/l. A review of the groundwater data collected at the Jones Sanitation site indicate that concentrations of arsenic are below 10 ug/l. Therefore, although the MCL has been lowered, the remedy remains protective of human health.

The water-quality data for the last several years indicate some minor exceedances of the (NYSDEC WQS) for benzene and chlorobenzene in well JSMW-3B. The concentrations of these constituents, however, did not exceed their respective MCL and within EPAs acceptable risk range (1 x 10^{-6} to 1 x 10^{-4}). Exceedances of VOCs in JSMW-3B are consistent with historical patterns. The well is located just off the southeastern edge of the cap (upgradient from the capped area but downgradient from the excavated contaminated areas). Groundwater in this area flows to the southwest. There is no indication from monitoring wells on the west end (JSMW-4A and JSMW-4B) of the property that any VOC contamination moves off-site.

The following metals have exceeded their respective NYSDEC WQS or MCL in either the total or filtered samples collected from several monitoring wells within the past five years: antimony, chromium, iron, manganese, selenium and nickel. Although these metals have exceeded their

respective NYSDEC WQS in "total" samples, the concentrations of metals in filtered samples are below EPA's non-cancer threshold of 1 (HI), with the exception of manganese and iron. The last round of samples collected indicate that iron concentrations in filtered samples have decreased and are now below EPA's non-cancer threshold of 1, but continue to exceed the RAO/cleanup goal and MCL.

Soil vapor intrusion was not evaluated during the RI as a potential future exposure pathway based on the conservative (health protective) assumption that buildings are located above the maximum detected concentration of the contaminants of concern in the groundwater. The pathway was initially identified and evaluated in the 2006 five-year review. The health-based screening criteria provided in the Draft Guidance for Evaluating the Vapor Intrusion to Indoor Air Pathway from Groundwater and Soils (USEPA, 2002) was used to initially evaluate this exposure pathway. This guidance provides calculations of concentrations in groundwater associated with indoor air concentrations at acceptable levels of cancer risk and non-cancer hazard. This review compared the maximum detected concentrations of the chemicals of potential concern with the vapor intrusion screening criteria. The maximum detected concentrations of several VOCs exceeded their respective risk based criteria (1×10^{-6}) but did not exceed the upper bound of the risk range (1×10^{-4}). This does not indicate that a vapor intrusion problem would occur if a building were to be erected on site. Therefore, this indicates that further investigation would not be necessary. This is consistent with conclusions made during the 2006 five-year review.

The soil remedy was reviewed to address the protectiveness of the remedy presented in the 1997 ROD. As stated earlier, the outlying trenches were excavated and placed in the landfill. RAOs/Cleanup goals for this area are listed in Table 4. Since the land use is designated residential, the cleanup criteria were compared to the Regional Screening Levels - Residential Soil. The RAOs/Cleanup Goals established are either within or below EPA's cancer risk range or below the non-cancer hazard index threshold of 1. Therefore, the RAOs are considered protective of human health.

The RAOs/Cleanup Goals established in the ROD are valid at this time. See Table 4.

A supplemental ecological risk assessment report, completed in February 2000, indicated no unacceptable ecological risk at the site. All assumptions included in the supplemental risk assessment remain valid.

Question C: *Has any other information come to light that could call into question the protectiveness of the remedy?*

No human health or ecological risks have been identified, and no weather–related events have affected the protectiveness of the remedy. No other information has come to light that could call into question the protectiveness of the remedy.

Based upon the results of the five-year review, it has been concluded that the selected remedy has been fully implemented. Institutional controls to protect the landfill remedy and to prevent the installation of potable water wells in the vicinity of the landfill were implemented. The existing groundwater quality data indicate that the site does not impact the off-site groundwater quality and only minimal impact was noted on-site in several of the monitoring wells.

VIII. ISSUES, RECOMMENDATIONS AND FOLLOW-UP ACTIONS

The selected remedy has been fully implemented. Institutional controls to protect the landfill remedy and to prevent the installation of potable water wells in the vicinity of the landfill were implemented. This site has ongoing operation, maintenance and monitoring activities as part of the selected remedy. As anticipated by the decision documents, these activities are subject to routine modification and adjustments. The existing groundwater quality data indicate that the site does not impact the off-site groundwater quality and only minimal impact was noted on-site in several of the monitoring wells.

Well JSMS-6B appears to be corroding and has been a source of nickel and chromium contamination. There is some concern that contamination from the well may be moving with the shallow groundwater off-site. It is recommended that the well be replaced by a PVC well, or even completely abandoned, if it can be demonstrated that there is no longer a need to monitor at this depth interval in this location.

Monitoring of on-site groundwater wells should continue on an annual basis. Reduction in monitoring frequency should be considered after additional data is collected to confirm that the area near wells JSMS-6A/6B is not a source of nickel/chromium contamination in the groundwater.

Table 6 shows recommendations and follow-up actions.

IX. PROTECTIVENESS STATEMENT

The remedy for the Jones Sanitation site protects human health and the environment. There are no exposure pathways that could result in unacceptable risks and none expected as long as the engineered and institutional controls currently in place continue to be properly operated, monitored and maintained.

X. NEXT REVIEW

Since hazardous substances, pollutants or contaminants remain at the Jones Sanitation Superfund site, the next five-year review for the site should be completed within five years from the date of this review.

Approved by:

6/27/2011

Walter E. Mugdan, Director
Emergency and Remedial Response Division

Date

Table 1
Chronology of Site Events

Event	Date
Final Listing on National Priorities List	1987
Administrative Order on Consent	1991
Remedial Investigation completed	1995
Feasibility Study Completed	1996
Record of Decision (ROD)	1997
Consent Order Entered	1998
Remedial Design approved	2000
Remedial Action performed	2001
Preliminary Closeout Report	2001
Final Closeout Report	2001
Site Deletion from NPL	2005
First Five-Year review	2006

Table 2

Documents, Data, and Information Reviewed in Completing the Five-Year Review

Record of Decision, 1997
Remedial Action Report
Close-out Report
Annual Long-term and Operation, maintenance Reports and Monitoring Reports
EPA Inspector general Report dated September 23, 2009, "Independent Sampling Generally Confirms EPA's Data at the Jones Sanitation Superfund Site"
EPA guidance for conducting five-year reviews and other guidance and regulations to determine if any new applicable or relevant and appropriate requirements relating to the protectiveness of the remedy have been developed since EPA issued the ROD

Table 3

Nickel and Chromium Sampling Results

Sampling Year	Parameters[a]	Jones Sanitation Landfill Monitoring Wells (with prefixes JSMW-)									
		1A	1B	3A	3B	4A	4B	6A	6B	8A	8B
2005	Ni	2.9	--[b]	--	--	--	--	--	491	3.2	--
	Cr	47.3	1.2	0.92	1.5	1.8	1.7	1.2	539	4.7	1.2
	Cond	NA[c]	NA	NA	NA	NA	NA	NA	NA	NA	NA
2006	Ni	5.8	--	--	--	--	--	--	470	--	--
	Cr	17	1.1	1.5	--	--	--	--	190	2.9	--
	Cond	0.252	0.49	768	<50	563	639	1,056	1,063	0.682	0.656
2007	Ni	4	3.2	3.8	6.1	5	3.4	4.7	556	5.7	2.8
	Cr	13.9	2.5	--	1.1	0.55	--	--	994	1.6	--
	Cond	0.427	0.501	0.811	631	621	628	1,020	1,150	680	704
2008	Ni	1.5	1.3	1.6	1.9	1.8	1.9	0.94	709	2.1	3
	Cr	4.4	1.1	--	0.5	0.74	0.5	0.45	3,010	0.33	--
	Cond	224	0.487	352	617	352	617	1.06	1,189	663	947
2011	Ni	6.1	1	1.5	4.6	3.8	1.5	--	639	6.4	1.6
	Cr	14.2	--	--	2.3	2.1	--	--	1,730	3.7	--
	Cond	431	513	792	672	505	621	941	1,060	678	853

[a] metal concentrations are unfiltered in µg/L, Conductivity in µS/cm[3]
[b] no detection
[c] data not available

Note: Data was not collected during 2009 or 2010, but was collected early 2011 instead.

Table 4

Site Cleanup Levels established for soil in the outlying trenches

COPC	Cleanup Levels
Organics	
PCE	<1400 ppb
4-methylphenol	<900 ppb
Fluoranthene	<50000 ppb
Pyrene	<50000 ppb
Benzo(a)anthracene	<220 ppb
Benzo(b)fluoranthene	<1100 ppb
Benzo(a)pyrene	<61 ppb
Indeno(1,2,3-cd)pyrene	<3200 ppb
Dibenzo(a,h)anthracene	<14 ppb
PCBs	<10 ppb
Inorganics	
Antimony	<9.6 ppm
Arsenic	<7.5 ppm
Barium	<300 ppm
Beryllium	<1.3 ppm
Cadmium	<1 ppm
Chromium	<25.9 ppm
Copper	<35.1 ppm
Manganese	<2240 ppm
Mercury	<0.1 ppm
Nickel	<41.1 ppm
Silver	<1.9 ppm
Vanadium	<150 ppm
Zinc	<141 ppm
Cyanide	<0.06 ppm

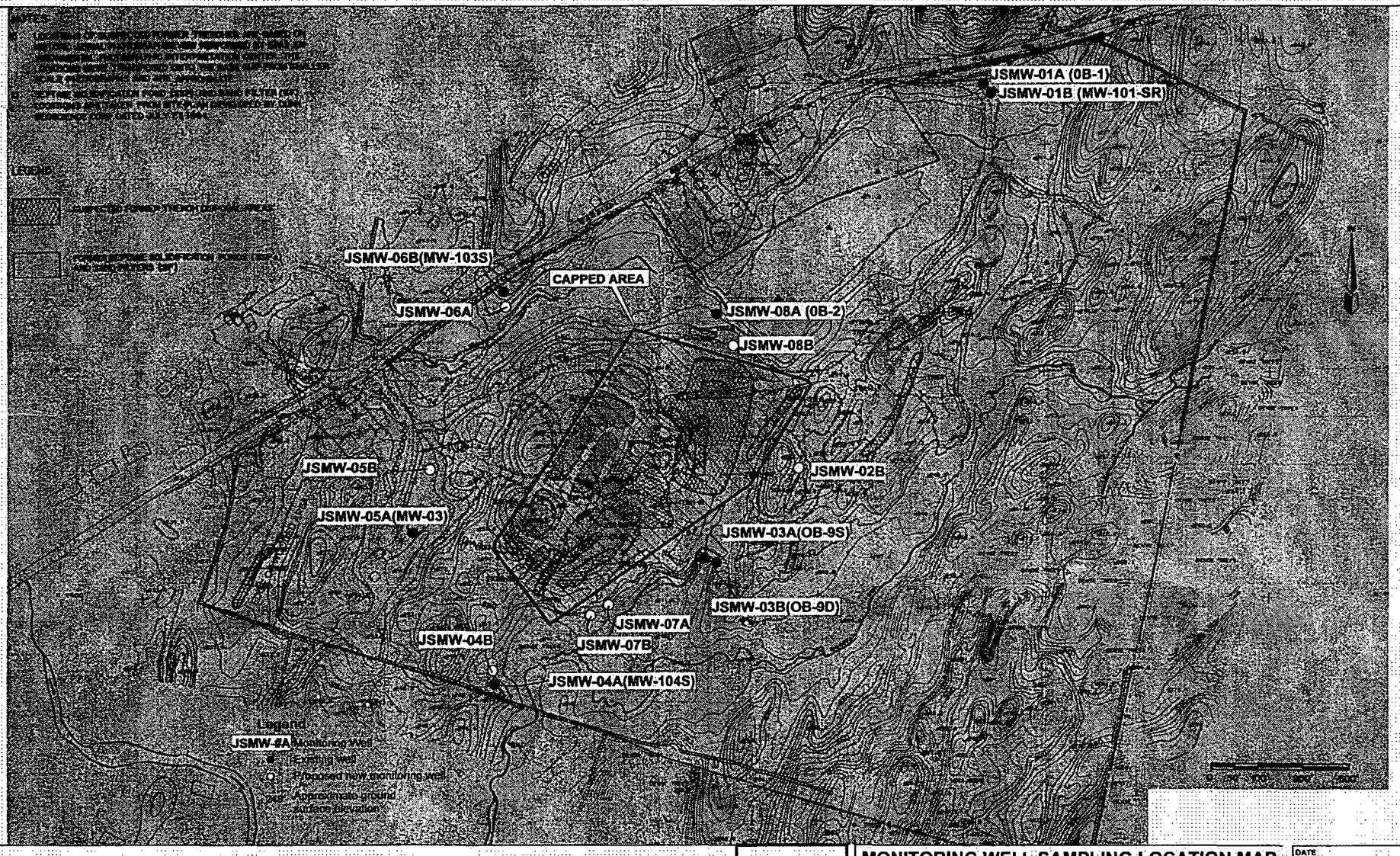
Table 5

Groundwater Chemical of Concerns Exceeding Cleanup Levels or Remedial Action Objectives at the On-Site Monitoring Wells

Chemical	Cleanup Level/ RAO (ug/l)	Current MCLs (ug/l)	Maximum Concentration (ug/l)	Well	Date of sample
Benzene	< 0.7	5	2.8 ug/l	JSMW-3B	2006
Chlorobenzene		100	19 ug/l	JSMW-3B	2006
TCE		5	1.4	JSMW-4A	2006
PCE		5	5.4	JSMW-4A	2006
Vinyl chloride	<2	2	0.35	JSMW-3B	2006
Cis -1,2- DCE		70	5.5	JSMW-4A	2006
1,2 - DCE			0.52	JSMW-2B	2006
1,2-Dichlorobenzene			1.8	JSMW-3B	2011
1,3-Dichlorobenzene			0.68	JSMW-3B	2011
1,4-Dichlorobenzene			0.96	JSMW-3B	2011
Manganese	300	50	1830	JSMW-3A	2011
Iron		300	43100	JSMW-3B	2011
Lead		15	29	JSMW-5A	2006

Table 6
Recommendations and Follow-up Actions

Issue	Recommendations And Follow-up Actions	Party Responsible	Oversight Agency	Milestone Date(s)	Affects Protectiveness (Y/N) Current	Future
Well JSMS-6B appears to be corroding and has been a source of nickel and chromium contamination	Demonstrate that Well JSMS-6B is no longer needed and either abandon or replace with a PVC well	PRP	EPA	September 2012	N	N



MONITORING WELL SAMPLING LOCATION MAP

JONES SANITATION FINAL CAP

TOWN OF HYDE PARK, DUTCHES COUNTY, NEW YORK

DATE: 01/2006

FIGURE: 3-2

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